IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : **10/567,171**
Applicant(s) : **EDWARDS et al.**
Filed : **2/3/2006**
TC/A.U. : **2629**
Confirmation : **9639**
Examiner : **MORRIS, John J.**
Atty. Docket : **GB030133US1**
Title: **CIRCUIT FOR SIGNAL AMPLIFICATION AND USE OF THE SAME IN ACTIVE MATRIX DEVICE**

Pre-Appeal Brief Request for Review

Mail Stop **AF**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the final Office action of 5 March 2009, the applicants request review of the final rejection in the above referenced application. No amendments are being filed with this request. This paper is being filed with a notice of appeal.

The Examiner rejects:

claims 1-10, 19-21, and 23-27 under 35 U.S.C. 103(a) over Tomooka et al. (USP 5,909,262, hereinafter Tomooka), Kobayashi et al. (USP 4,432,610, hereinafter Kobayashi), and Suzuki et al. (USP 4,621,260, hereinafter Suzuki);

claims 11-18 under 35 U.S.C. 103(a) over Tomooka, Kobayashi, Suzuki, and Miyake et al. (USP 6,788,108, hereinafter Miyake); and

claim 22 under 35 U.S.C. 103(a) over Tomooka, Kobayashi, Suzuki, and Abe (USP 5,694,369).

Each of claims 2-26 is dependent upon claim 1, and the Examiner rejects claim 27 on the same basis as claim 1.

This review is requested for the reasons stated on the attached sheets.

Clear errors in the examiner's rejection(s):

The applicants claim two voltage-dependent capacitors and a switching arrangement that changes the capacitance of each of these voltage-dependent capacitors to effect changes of gain.

In the final Office action, at page 2, second paragraph, the Examiner asserts that Suzuki's capacitors 24 and 28 are voltage-dependent capacitors. This assertion is incorrect. Suzuki does not teach or suggest that capacitors 24 and 28 are voltage-dependent; Suzuki's schematics indicate that capacitors 24 and 28 are fixed-value capacitors; and, most significantly, Suzuki's formulae as given in equations (1), (2), and (3), and the companion text at column 5 line 21 to column 6, line 17, necessarily require that the capacitances Cp (capacitor 24) and Cz (capacitor 28) be constant.

Suzuki's invention is specifically designed to apply a correction voltage to compensate for losses caused by parasitic capacitance. If the circuit used to provide this correction does not provide the voltage specified in Suzuki's equation (3), which includes fixed-values for the capacitors 24 and 28, the correction amount will be wrong, and the picture quality will be diminished.

In the Advisory action, the Examiner asserts that the applicants have admitted that Suzuki's capacitors 24 and 28 have voltage controllable capacitance. This assertion is also incorrect. In the applicants' remarks of 26 January 2009, the applicants acknowledged that Miyake's capacitors 2154 and 2155 are transistors, and therefore *could* be (but are not) configured to provide voltage-dependent capacitance. The applicants did not reference Suzuki's capacitors 24 and 28, as asserted in the Advisory action. Of particular note, Suzuki does not teach or suggest that capacitor 28 is a voltage-dependent capacitor, and the Examiner offers no evidence to support the assertion that this capacitor is a voltage-dependent capacitor.

The Examiner also appears to believe that a capacitor requires a voltage to exhibit capacitance: "voltage could turn on or off the capacitor" (final Office action, page 2, line 8). This is obviously incorrect. A device's capacitance is defined by the area of the plates, the distance between the plates, and the material between the

plates; a variable capacitor is created by varying the area, the distance, or the characteristics of the material. A conventional capacitor (such as Suzuki's capacitor 28) has a constant capacitance, regardless of whether voltage is applied or not, because it comprises two plates separated by a dielectric material.

Because the Examiner's assertion that Suzuki's capacitor 28 is a voltage-dependent capacitor is clearly erroneous, the applicants respectfully maintain that the rejection of claims 1-10, 19-21, and 23-27 under 35 U.S.C. 103(a) over Tomooka, Kobayashi, and Suzuki is unfounded, and should be withdrawn.

The examiner's omissions of one or more essential elements needed for a prima facie rejection:

The Examiner fails to identify where the combination of Tomooka, Kobayashi, and Suzuki teaches or suggests a switching arrangement that is configured to receive a first gain-control signal to change the capacitance of the first capacitor and a second gain-control signal to change the capacitance of the second capacitor, as specifically claimed in claim 1.

The Examiner acknowledges that neither Tomooka nor Kobayashi teaches or suggests a second gain-control signal to change the capacitance of the second capacitor, and fails to show where Suzuki provides this teaching. Instead, the Examiner merely states "Suzuki teaches two capacitors each with their own control signal". The applicants respectfully note that "two capacitors each with their own control signal" does not correspond to the claimed first ***gain-control*** signal to ***change the capacitance*** of the first capacitor and a second ***gain-control*** signal to ***change the capacitance*** of the second capacitor, as specifically claimed.

Suzuki does not teach or suggest a ***gain-control*** signal. Suzuki teaches a correction signal that compensates for the effects of parasitic capacitors. Suzuki does not teach or suggest controlling the gain of any component or circuit. Further, Suzuki does not teach or suggest ***changing the capacitance*** of any component or circuit.

Because the Examiner fails to identify where the combination of Tomooka, Kobayashi, and Suzuki teaches or suggests a switching arrangement that is configured to receive a first gain-control signal to change the capacitance of the first

capacitor and a second gain-control signal to change the capacitance of the second capacitor, as specifically claimed in claim 1, the applicants respectfully maintain that the rejection of claims 1-10, 19-21, and 23-27 under 35 U.S.C. 103(a) over Tomooka, Kobayashi, and Suzuki is unfounded, and should be withdrawn.

Further, the Examiner fails to identify where the combination of Tomooka, Kobayashi, and Suzuki teaches or suggests a first mode in which the input voltage is provided to an input terminal of at least the first capacitor, and a second mode in which the switching arrangement causes charge to be redistributed between the first and second capacitors, as also specifically claimed in claim 1.

The Examiner asserts that Kobayashi teaches a second mode in which the switching arrangement causes charge to be redistributed between capacitors 80 and 82 at column 6, line 62 - column 7, line 33. This assertion is incorrect. At the cited text Kobayashi teaches:

> "As shown in FIG. 7, each cell comprises two variable capacitors 80 and 82. One end of the capacitor 80 is connected to one end of the capacitor 82 and to a data terminal 42 through a data line 40. The other end of the capacitor 80 is connected to an address terminal 46 through a selection line 44. The other end of the capacitor 82 is connected to an aluminum electrode 48.
> Describing the writing of the data in the LSI circuit cell, it is assumed that the electrons are trapped in the nitride layers 72 of all the cells, and that depletion layers are formed in the n-type substrate 62. After setting all the address terminals 46-1 to 46-J to the ground level, and the data terminals 42-1 to 42-I to the ground level or to a suitable negative level according to the picture image of the column to be written, the address terminal of the desired column alone is set at a suitable negative writing level. In a cell in which the data terminal 42 is set at the ground level, the electrons trapped in the insulation layer 72 are released in the n-type substrate 62. In a capacitor in which the electrons in the nitride layer 72 are released, the depletion layer does not extend to the n-type substrate 62 unless a high electric field is applied to both its ends. Thus, the capacitance of the capacitor 80 between the n-type substrate 62 and the polycrystalline silicon layer 74, i.e., the data line 40 and the selection line 44, becomes great. The capacitance of the capacitor 82 between the data line 40 and the aluminum electrode 48 also becomes great. For this reason, an AC voltage is applied to the liquid crystal 22, and the liquid crystal 22 becomes transparent. On the contrary, in the cell in which the data terminal 42 is set at a suitable negative level, the electrons in the nitride layer 72 are not released and remain trapped. In a capacitor in which the electrons in the nitride layer 72 remain trapped, the depletion layer extends into the n-type substrate 62 unless a high electric field is applied to

> both ends of the capacitor. Thus, the capacitances of the capacitors 80 and 82 are small. For this reason, an AC voltage is not applied to the liquid crystal 22 so that the liquid crystal is nontransparent." (Kobayashi, column 6, line 62 - column 7, line 33.)

As is readily apparent, the cited text does not address a ***redistribution*** of charge between capacitors 80 and 82, as asserted by the Examiner.

As is well known in the art, the term 'redistribution of charge' describes the collection of charge on one capacitor, then coupling that capacitor to another capacitor, to transfer a portion of the charge to the other capacitor. As Kobayashi's FIG. 7 clearly illustrates, capacitors 80 and 82 are always coupled together; as such, any charge is always distributed to both capacitors 80 and 82, and no ***redistribution*** of charge can occur between these two capacitors.

Even assuming in argument that the continuous distribution of charge between Kobayashi's capacitors 80 and 82 could be considered a 'redistribution' of charge, the applicants claim two modes, one mode in which the first capacitor receives the charge, and an other mode in which the charge is shared between the two capacitors. Because Kobayashi's capacitors 80 and 82 are always coupled together, the sharing of charge between the capacitors cannot be defined as an 'other' mode.

Because the Examiner fails to identify where the combination of Tomooka, Kobayashi, and Suzuki teaches or suggests a first mode in which the input voltage is provided to an input terminal of at least the first capacitor, and a second mode in which the switching arrangement causes charge to be redistributed between the first and second capacitors, as also specifically claimed in claim 1, the applicants respectfully maintain that the rejection of claims 1-10, 19-21, and 23-27 under 35 U.S.C. 103(a) over Tomooka, Kobayashi, and Suzuki is unfounded, and should be withdrawn.

Respectfully submitted,

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